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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,519	08/30/2005	Stefan Nordhoff	5003073.060US1	5177
29737 7590 02/15/2011 SMITH MOORE LEATHERWOOD LLP P.O. BOX 21927 GREENSBORO, NC 27420				
EXAMINER ZALASKY, KATHERINE M				
ART UNIT		PAPER NUMBER		
1777				
NOTIFICATION DATE		DELIVERY MODE		
02/15/2011		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/527,519

Applicant(s)

NORDHOFF ET AL

Examiner

KATHERINE ZALASKY

Art Unit

1777

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8 December 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7-9,11 and 13-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7-9,11 and 13-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-945)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

RCE acknowledged

A request for continued examination(RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/08/2010 has been entered.

Claim Status

1. **Claims 1, 3-5, 7-9, 11 and 13-23**, as amended 8 December 2010, are currently pending. **Claims 2, 6, 10, 12 and 24** are cancelled.

Claim Interpretation

2. It is noted that **claims 1, 3-5, 7-9, 11, 13-16 and 19-24** are directed to an apparatus. Regarding limitations recited in these claims which are directed to a manner of operating disclosed device, it is noted that neither the *manner of operating a disclosed device nor material or article worked upon* further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an

intended operation are of no significance in determining patentability of the apparatus claim."

Claim Rejections - 35 USC § 103

3. **Claims 1, 3-5, 7-9, 11 and 13-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Henriquez (US 4,840,737) in view of Bastiaensen et al. (WO 00/01657, as translated by US 6,541,665), Meisenburg et al. (US 3,801,285) and Kahmann et al. (US 2,770,533) or, alternatively, Bastiaensen et al. (WO 00/01657, as translated by US 6,541,665) in view of Henriquez (US 4,840,737), Meisenburg et al. (US 3,801,285) and Kahmann et al. (US 2,770,533).

Regarding **claims 1 and 13**, Henriquez discloses a washing apparatus comprising:

- a first region, to which a wash material is supplied (Figure 1, inlet 21, cavity 23)
- a second region, in which the wash material is washed (Figure 1, cavity 25)
- a third region (Figure 1, cavity above grid 26, 28)
- a flow resistor provided between the second region and the third region (Figure 1, disintegrator 26)

wherein the second region is at least partially in the form of a column (C2/L54-57).

The reference does not explicitly disclose the column has a diameter of at least about 300 mm or greater. However, since the instant specification is silent to

unexpected results, it would have been obvious to one of ordinary skill in the art to change the diameter of the column, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device, *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

Additionally, while the third region is not explicitly shown to be capable of melting the material, the reference discloses that the apparatus comprises static resisting means and disintegration means. The reference also adds that disintegration of the bed of crystals can be achieved through melting (C1/L16-18, L26-29).

Bastiaensen et al. discloses a method of producing and purifying acrylic acid through crystallization (abstract). While the reference does teach that once the crystals are formed, they are transported to a separation unit to be filtered from the mother liquor and then washed (C5/L39-C6/L3), Bastiaensen et al. does not provide any specific apparatus for this process. The reference does teach, however, that the crystal washing steps may be combined with a melting step in order to further increase the purity of the crystals (C5/L66-C6/L20).

It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a melting region after or in conjunction with the resisting means of Henriquez, as taught by Bastiaensen et al., since doing so will help increase the purity of the final product.

Alternatively, it would have been obvious to one having ordinary skill in the art at the time of the invention to obtain the details of the separating and washing apparatus which are missing from the method of Bastiaensen et al. by performing a literature search or by reviewing known references, such as Henriquez.

The use of a heat exchanger in the third region to perform the melting is not explicitly stated in either reference. However, it is extremely well known in the art of melt crystallization to use heat exchangers for this purpose. This is supported by Meisenburg et al., at least. It would have been obvious to one having ordinary skill in the art to use a heat exchanger in the third region to permit the melting stage since doing so amounts to nothing more than the selection of one solution from a predictable number of known devices for melting crystals in wash columns to achieve a predictable result.

Additionally, regarding **claims 1, 11, 13 and 14**, while Henriquez does disclose an inlet for the suspension (Figure 1, inlet 19, C5/L26-30), the reference does not disclose a material conveying means comprising an outlet and a connection to a first region and further comprising a pump wherein the material conveying means supplies a wash material to the first region. Further, the reference does not disclose that the conveying means free of pulsation has a conveyor spiral, or the apparatus wherein a

dwell-time container is provided between the crystal-producer and the washing apparatus.

Meisenburg et al. discloses a spiral-shaped conveying apparatus for transporting a crystal suspension (abstract). The apparatus may include a pump to help convey the mother liquor (C4/L49-61). The apparatus includes cooling sections which help recover crystals and slow conveying means which help to mix and homogenize the suspension without the risk of crystals being deposited from the mother liquor (C2/L17-56).

It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a spiral-conveyor between the crystal synthesis apparatus and the wash column of modified Henriquez, as taught by Meisenburg, since doing so will help to further develop the crystals through cooling and also prevent crystals from becoming separated from the mother liquor while being transported to the filtration and wash column.

Finally, regarding **claims 1, 7-9 and 13**, while Henriquez discloses that the disintegrator may be of any known form, including wire mesh, perforated plates, conventional rotating knives, etc. (C2/L28-68, C5/L62-C6/L7) and that the flow resistor is stationary and is arranged non-rotatable about a central longitudinal axis of the second region (Figure 1, disintegrator 26, C5/L26-40, a perforated plate comprises multiple openings). None of the above references disclose that the cross-section of the openings in the disintegrator facing the second region are 10 times larger than the cross-section of the openings in the disintegrator facing the third region.

It is known in the art that perforated plates having funnel shaped openings may be used within melt crystallization systems (as evidenced by Kahmann et al., US 2,770,533, Figure 1, plate 14, perforations 25). The change in configuration of shape of a device is obvious absent persuasive evidence that the particular configuration is significant. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify vessel of modified Henriquez to include a perforated plate with funnel shaped openings as the disintegrator, as taught by Kahmann et al. The choice represents nothing more than a selection from a finite number of predictable solutions for perforated plates for use in crystallization systems.

The references are silent as to the relationship of the dimensions of one cross-sectional opening to the other. Since the instant specification is silent to unexpected results, it would have been obvious to one of ordinary skill in the art to change the size of the perforation openings on either side of the plate, since such a modification would have involved a mere change in the size (or dimension) of a component. A change in size (dimension) is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device, *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984). It would have been obvious to one

having ordinary skill in the art to optimize the sizes of the openings to accommodate/pass the proper crystal size through the openings.

The resultant disintegrator plate would have a variable cross-sectional area, where the disintegrator is characterized by a relative free cross-sectional area in the range from 0 to less than about 100%, relative to the total area of the flow resistance (perforated plate, open space must be between 0 and 100%).

Regarding **claims 3-5**, modified Henriquez discloses all of the claim limitations as set forth above. Additionally, Henriquez discloses the washing apparatus wherein:

- there is provided between the first region and the second region a solid/liquid separation apparatus, having a filtrate offtake line (Figure 1, inlet 21, cavity 23, cavity 25, filter 20, filtrate discharge 24)
- the solid/liquid separation apparatus is in the form of a filter in a wall adjacent to the second region (Figure 1, inlet 21, cavity 23, cavity 25, filter 20, filtrate discharge 24, C5/L26-33)
- the wall is arranged at an angle in the range from 0 to less than about 90°, relative to the central longitudinal axis (Figure 1, filter 20, filtrate discharge 24, C5/L26-33)

Regarding **claims 15 and 16**, modified Henriquez discloses all of the claim limitations as set forth above. Additionally, Bastiaensen et al. discloses a synthesis device comprising a synthesis installation and downstream a purification apparatus as defined in **claim 13**, wherein the synthesis device wherein the synthesis installation is a gaseous phase oxidation synthesis unit (C1/L5-20, C5/L39-55).

Regarding **claim 17**, modified Henriquez discloses all of the claim limitations as set forth above. Additionally, Henriquez discloses a method of purifying a wash material, wherein the wash material is supplied by way of the first region of a washing apparatus defined in **claim 1** and a target product is obtained (C3/L6-54).

Regarding **claim 18**, modified Henriquez discloses all of the claim limitations as set forth above. Additionally, Bastiaensen et al. discloses the method wherein the wash material contains at least about 20% of the target product by weight (C5/L66-C6/L7, Table 1).

Regarding **claim 19**, modified Henriquez discloses all of the claim limitations as set forth above. Additionally, Bastiaensen et al. discloses a product selected from the group consisting of food, polymers, fuels, lubricants, cleaning agents, dyes and pharmaceuticals comprising target product made by the method of **claim 17** (C1/L5-20).

Regarding **claim 20**, modified Henriquez discloses all of the claim limitations as set forth above. Additionally, Bastiaensen et al. discloses a product selected from the group consisting of food, monomers, fuels, solvents, waste-water treatment and isomer separation prepared by a purification apparatus of **claim 13** (C1/L5-20).

Regarding limitations recited in **claims 21-23** which are directed to a manner of operating disclosed apparatus, it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See Ex parte Thibault, 164 USPQ 666, 667 (Bd. App.

1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

Response to Arguments

4. Applicant's arguments filed 24 November 2010 have been fully considered but they are not persuasive.

5. Applicant has argued that the cited references do not teach, suggest or disclose (1) the use of a heat exchanger and the temperature of such heat exchanger, (2) the pressure limitations of a first region, (3) the pressure limitations of the second region, or (4) the flow resistor between the second and third regions. Applicant has also stated that the rejection does not articulate any reasoning as to how these limitations were taught, suggested or disclosed in the cited references.

6. First, a heat exchanger has been taught by Meisenburg et al. Applicant has not pointed to any deficiency in the rejection as to why this feature is not taught by the reference.

7. Second, the limitations of the temperature used and the pressures of the different regions have no bearing on an apparatus claim. These are process limitations. Applicant has not articulated any explanation of the structural elements these limitations may represent. If the structure is capable of achieving these limitations (presence of a heat exchanger and different regions), then the claim limitations are met.

8. Finally, the limitation of the flow resistor between the second and third regions has been discussed extensively in the above rejection. Applicant has failed to propose any argument which explains why the modified disintegrator fails to meet this limitation.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KATHERINE ZALASKY whose telephone number is (571) 270-7064. The examiner can normally be reached on 7:30am - 4:00pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Vickie Kim/

Supervisory Patent Examiner, Art Unit 1777